

# Halifax Harbour Water Quality Monitoring Project Survey Summary #123

**Survey Date:** 14 February 2007  
**Nature of Survey:** Complete Survey  
**Report File (this document):** HHWQMP\_report123\_070214.doc  
**Data File:** HHWQMP\_data123\_070214.xls

**Data Return:**  
 Profile: 97%  
 Bacteria: 97%  
 Chemical: 100%  
**Overall: 98%**

**Sample Notes:**

DYC was skipped due to ice.  
 BYC was iced in; alternate site was used: 44° 42.995' N, 63° 39.952' W.  
 Alternate site was used for PC due to wind: 44° 36.684' N, 63° 34.043' W.

**QA/QC samples:**

Chemical Analysis		F2 - 10m	
Detectable Parameter	Units	reference sample	QA/QC
Ammonia (as N)	mg/L	0.06	0.06
Total Suspended Solids	mg/L	5.4	2.3
Copper	µg/L	0.3	0.3
Iron	µg/L	7.0	3.0
Manganese	µg/L	3.0	<1.0
Zinc	µg/L	2.0	2.0

**Fecal Coliform (CFU/100ml)**

Site	C3 - 1m	E1 - 10m	BRB - 1m	F2 - 10m
Reference	9	82	200	5
QA/QC	14	99	320	7

**Comments:**

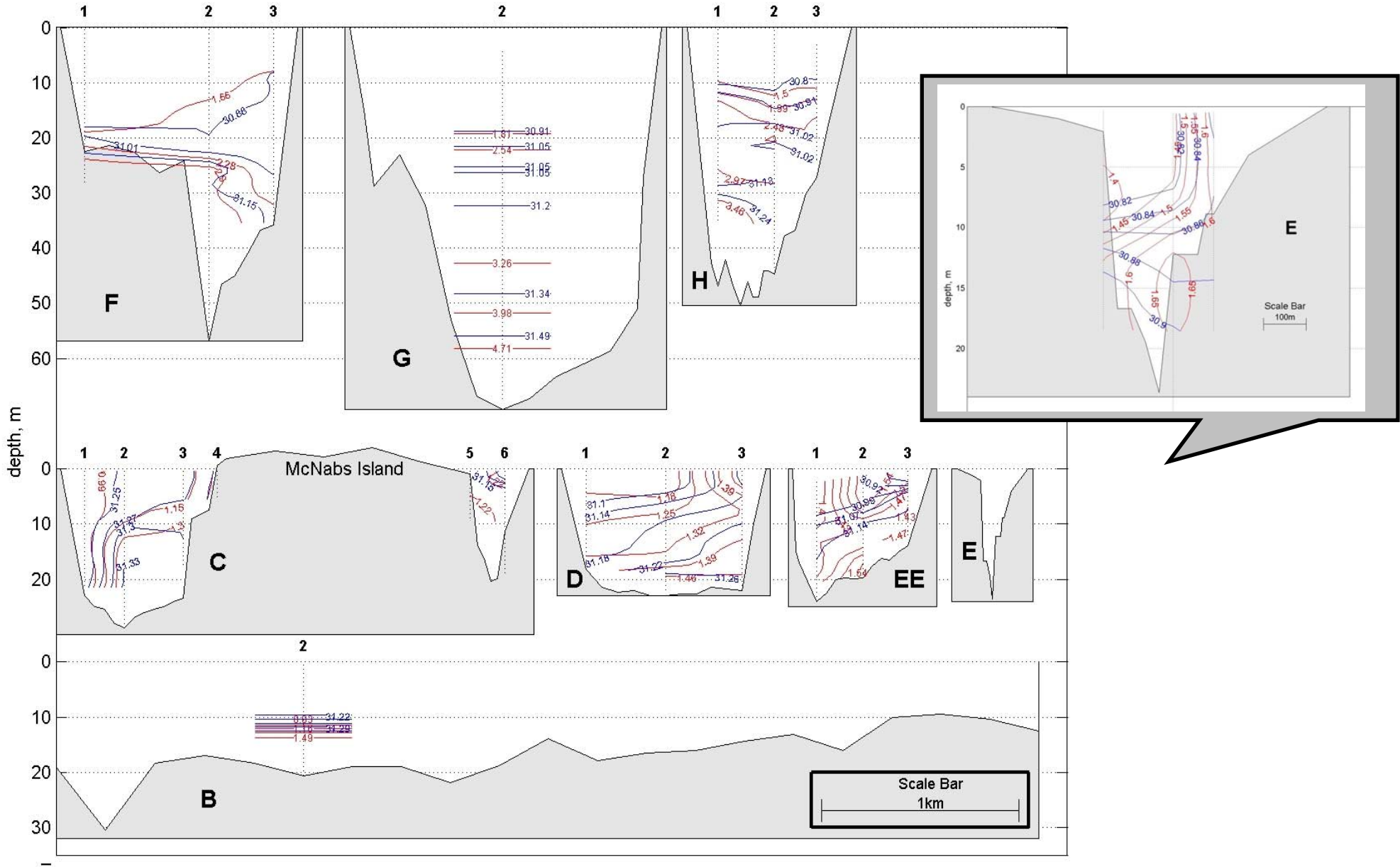
**General:** There has been no precipitation in the five days before the survey, and the average air temperature has been well below freezing. It appears that there has been little or no natural freshwater input into the harbour and the effect of the ever-present freshwater sewage load is not apparent. The harbour is very saline and well mixed everywhere including the top 20m of the Basin. There is less than 0.5 PSU variation in the surface water from BYC to site B2. Likewise, the temperature is uniform at 1-1.5°C. The deeper Basin is still stratified, but to a much lesser extent than normal. There is only a 0.8 PSU and 4°C difference from top to bottom in the deepest part of the Basin. Remarkably, since these two parameters have counteracting effects on density, there is only a 0.35 sigma total vertical density difference at this site. The fecal coliform (FC) values are very low except in the centre of the Inner Harbour (D and EE sections). Here, there are typically high values that are quite vertically uniform. The exception is site EE3, where the 1m values are very high and those at 10m, low. The field notes indicate that this sample was taken in the visible plume from the Peace Pavilion outfall. Given the relatively low ambient density variation, the density gradient in the plume can be seen to extend to a depth of 3-4 m. The FC values at both PC and RNSYS are high, rather than one or the other.

**Fluorescence:** Fluorescence values are a bit higher than last survey, with profile maximums of almost 3 mg/m<sup>3</sup> in the Basin to just over 1 mg/m<sup>3</sup> in the Outer Harbour.

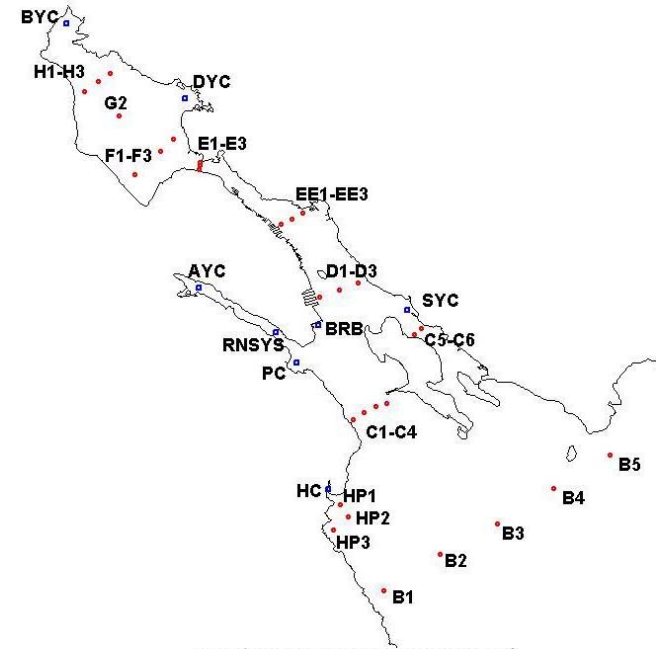
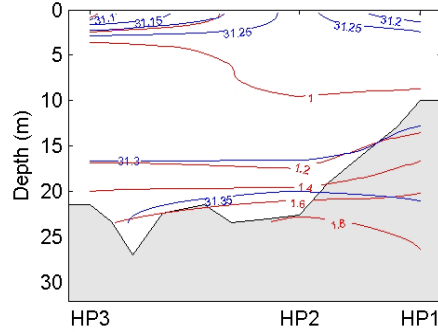
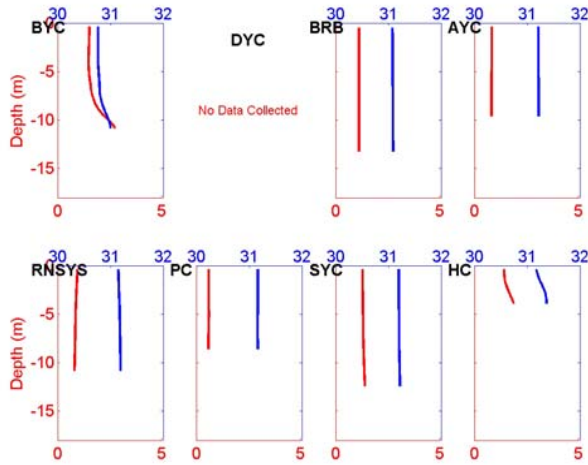
**Ammonia:** The ammonia values vary only from <0.05 to 0.09 mg/L. There is a slight indication that the 1m values are higher than the 10m values, but this may not be significant.

**TSS:** The TSS values are up to twice the values recorded last survey (0.6–5.8 mg/L) and there is no obvious pattern. These values are still quite low.

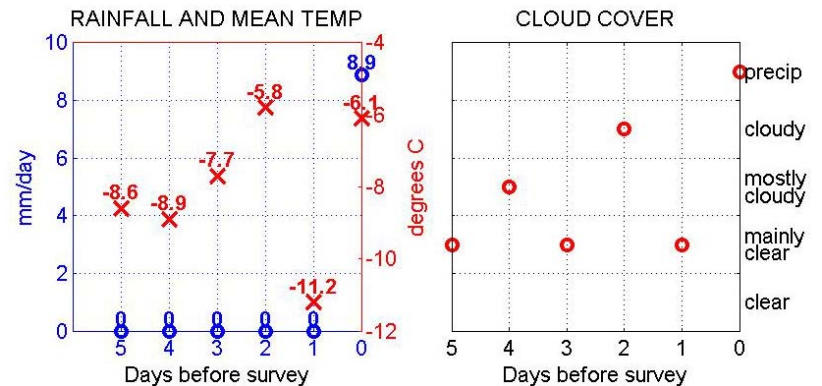
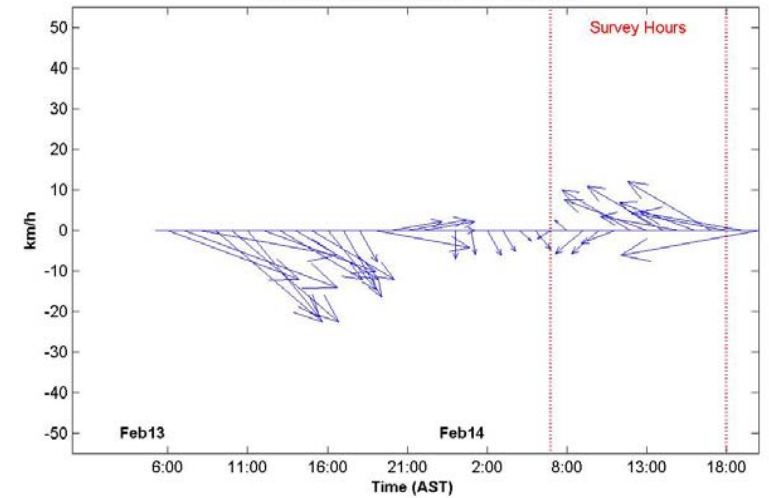
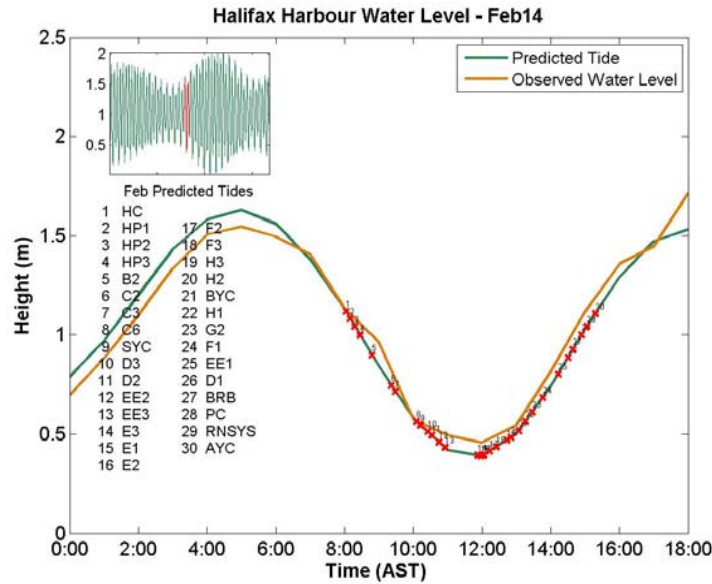
**Dissolved Oxygen:** The DO data is very uniform. The data indicates that the surface values (<20 m) are generally between 7.5 and 7.9 mg/L everywhere, with values just over 8.0 mg/L in the Outer Harbour. The Basin bottom water is relatively unchanged from last survey at 2.3 mg/L, notable given the lack of stratification. The only areas below applicable guidelines are the Basin bottom waters (< 7.0 mg/L) and the bottom few meters of the Outer Harbour (< 8.0 mg/L). The DO data are not ground-truthed and absolute values are questionable (see DO discussion in QR#1).



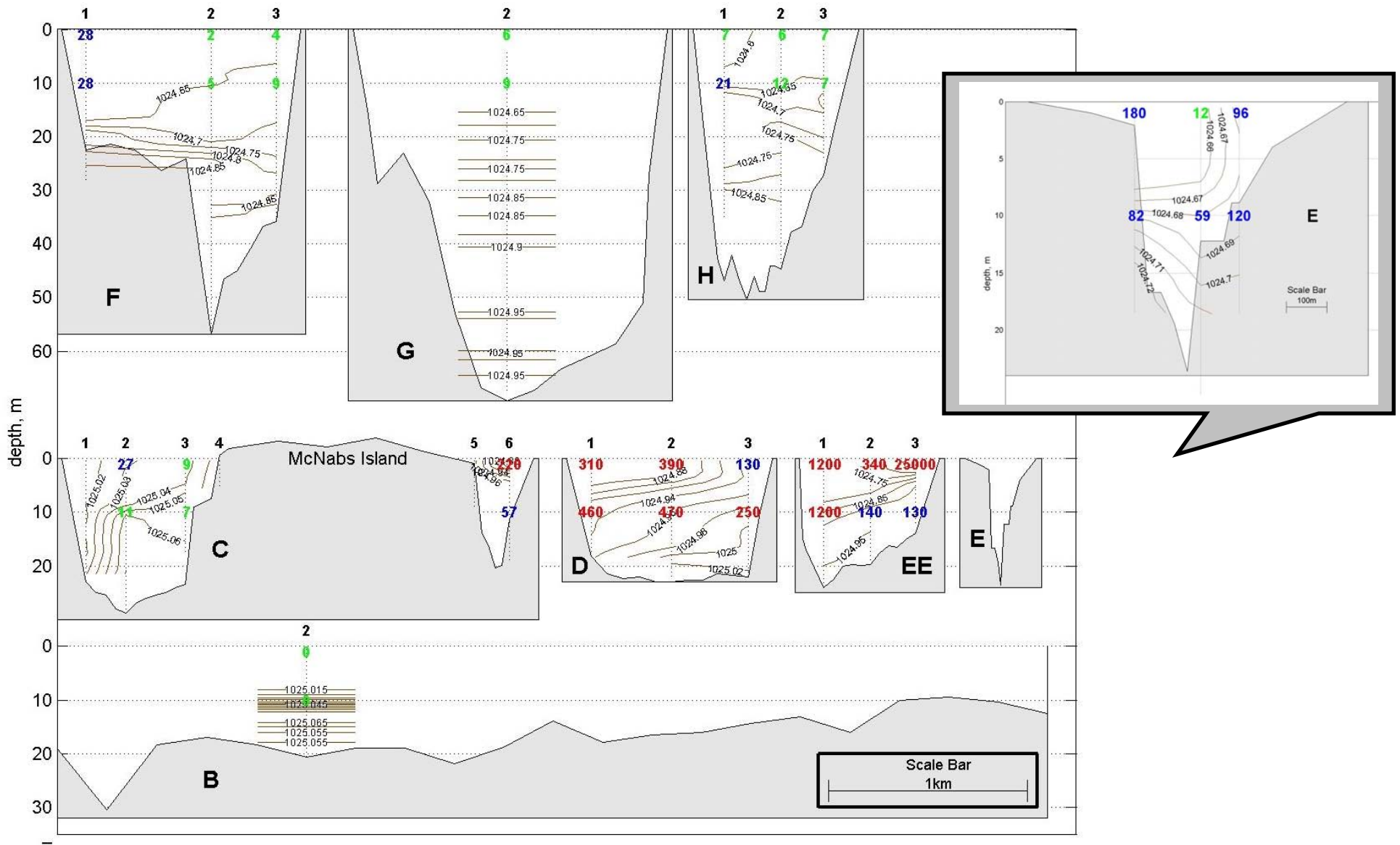
# Yacht Clubs



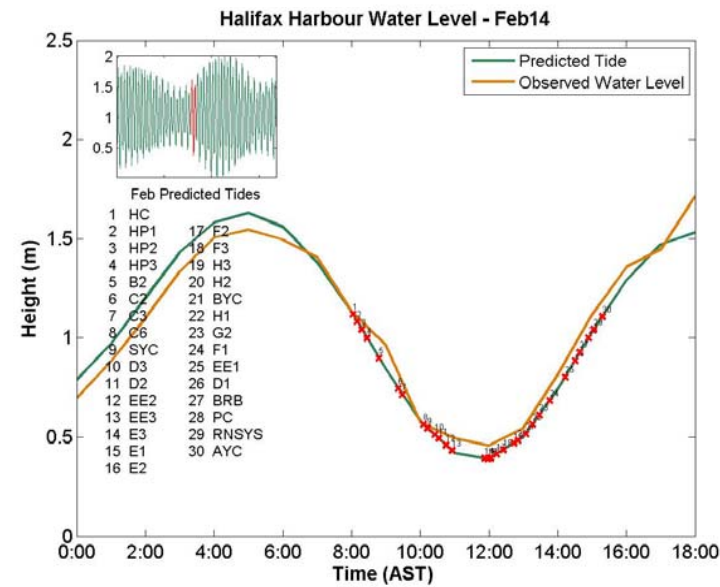
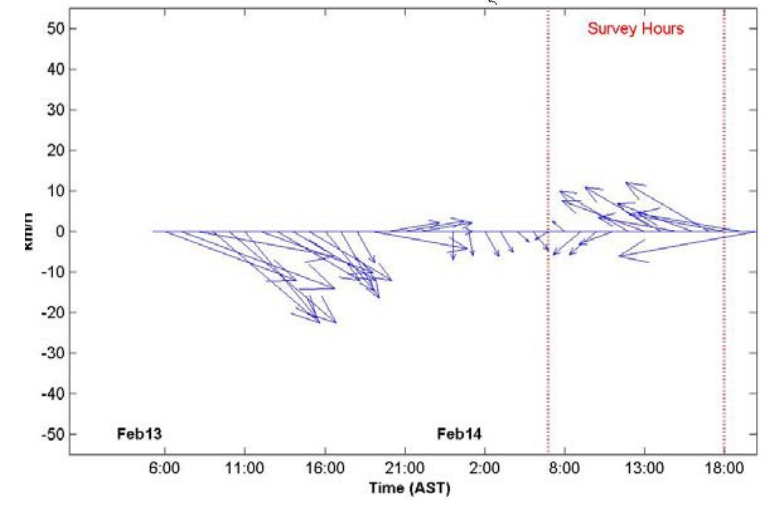
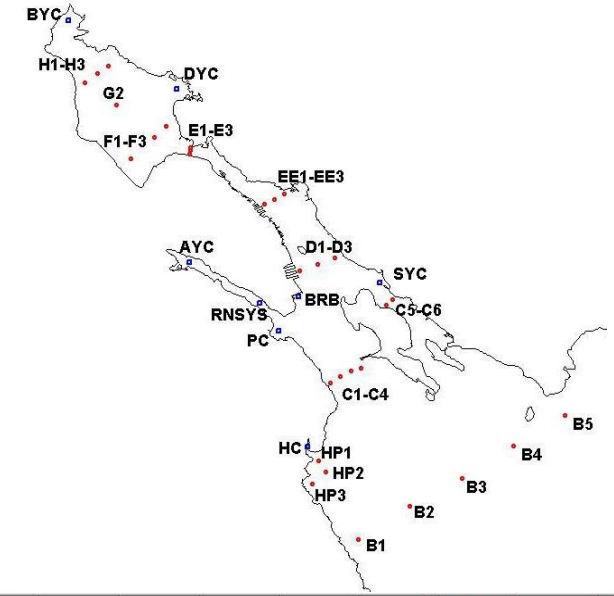
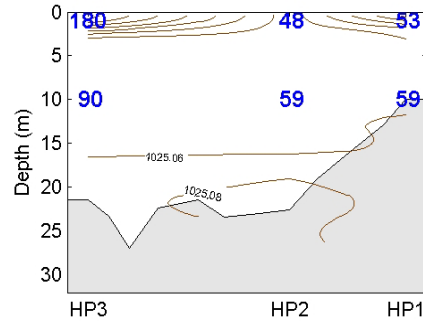
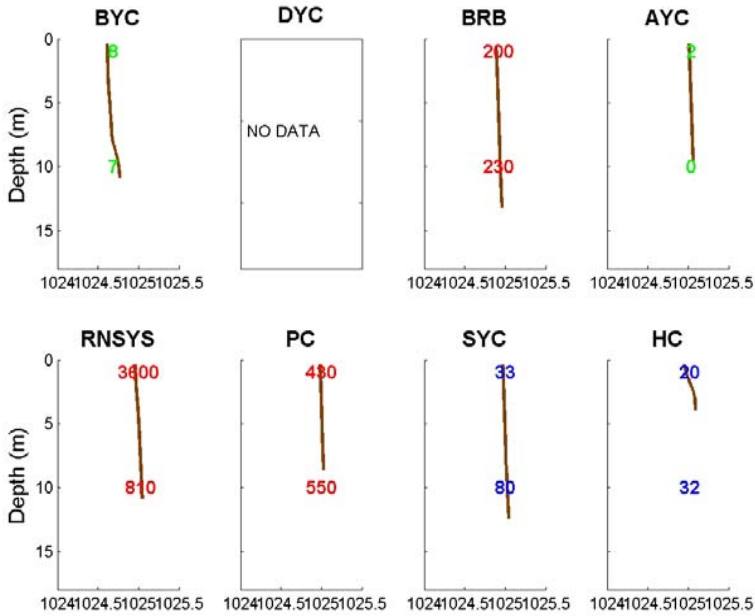
Rainfall and temperature data collected at Shearwater Autoport.  
Cloud cover data collected at Shearwater Airport



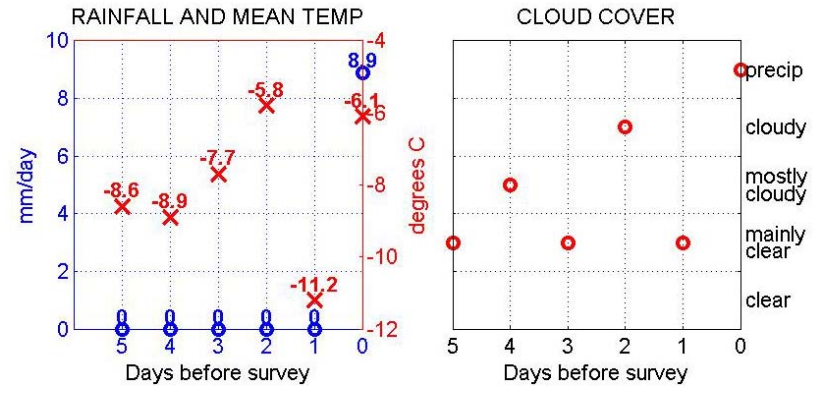
Salinity in PSU      Temperature in °C



# Yacht Clubs

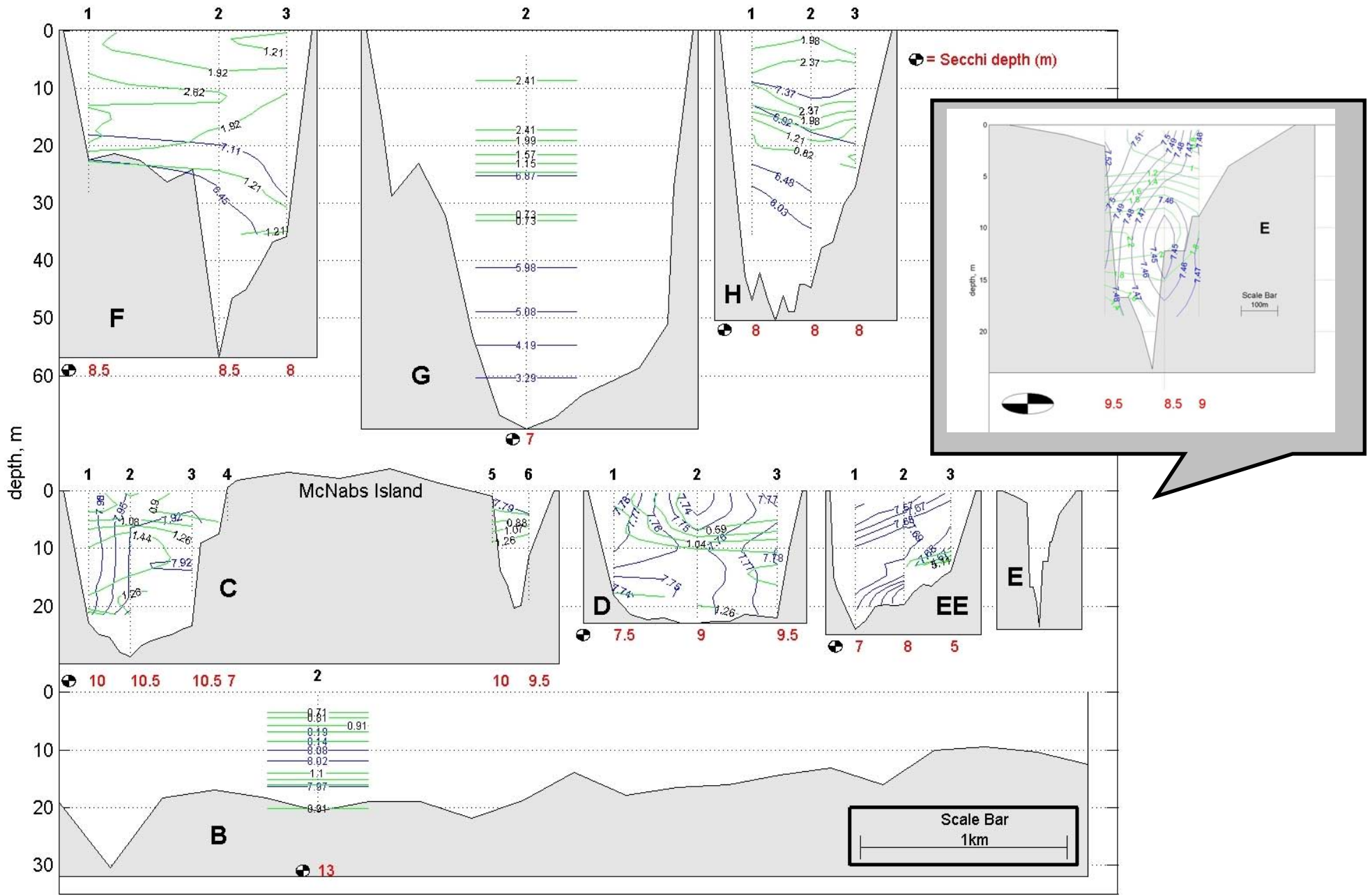


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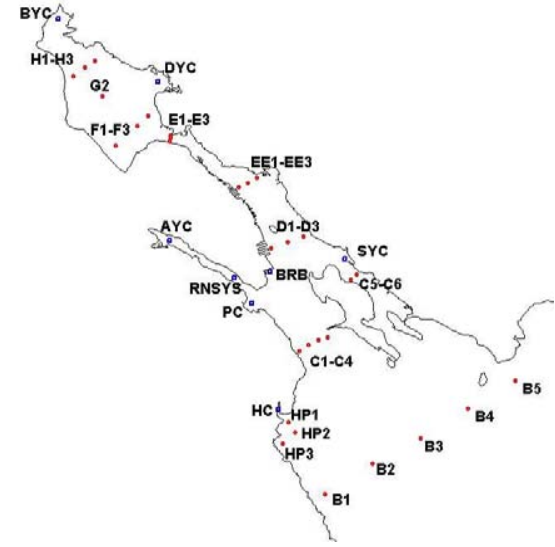
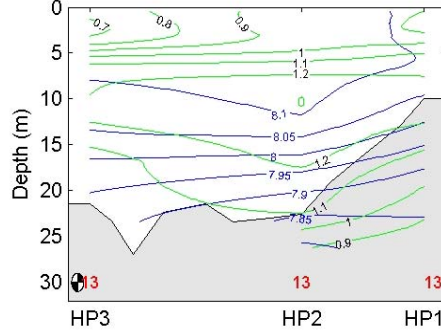
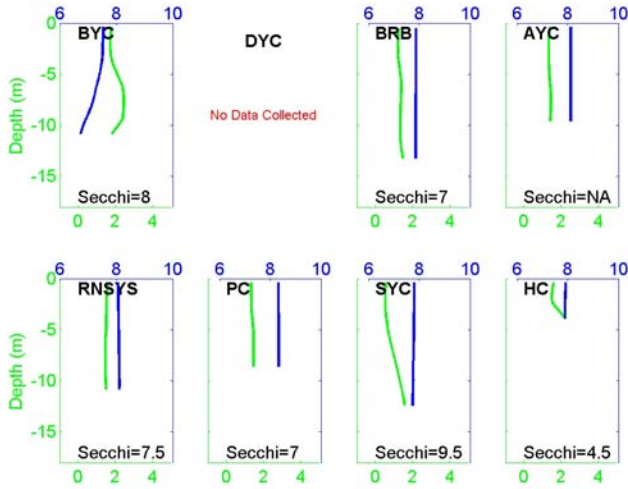


Potential Density in kg/m<sup>3</sup>

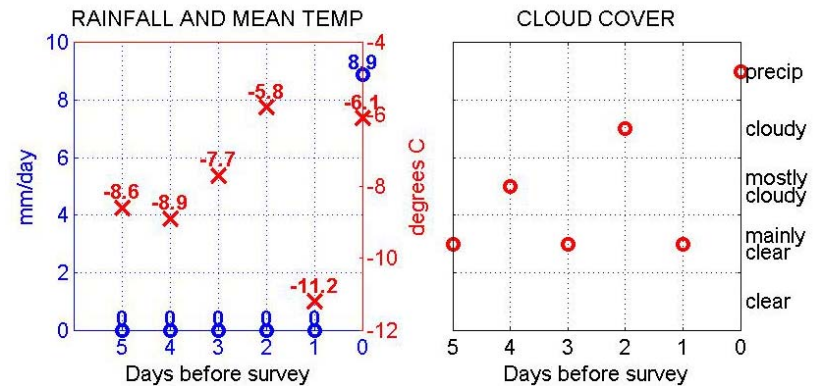
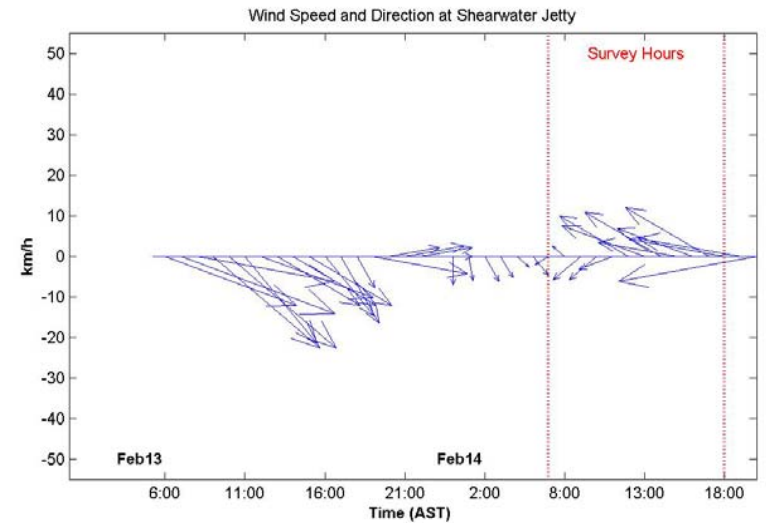
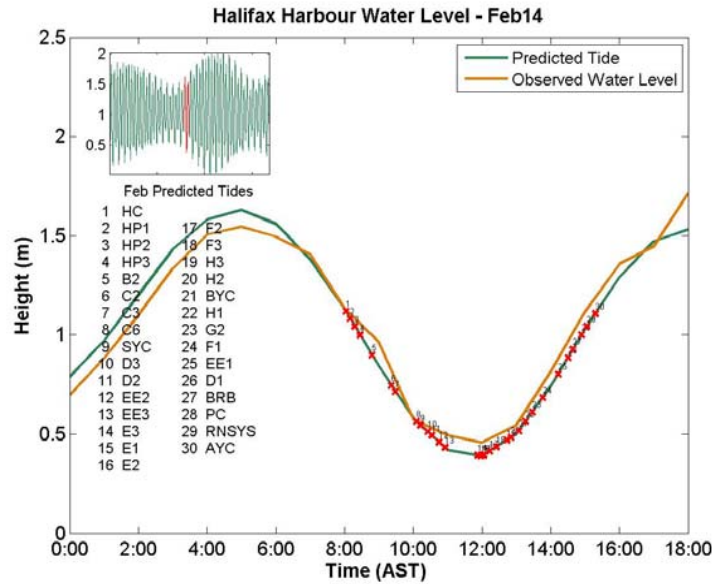
Fecal coliform: **above swimming limit (200 cfu/100mL)**  
**above shellfish limit (14 cfu/100mL)**  
 below limits



# Yacht Clubs



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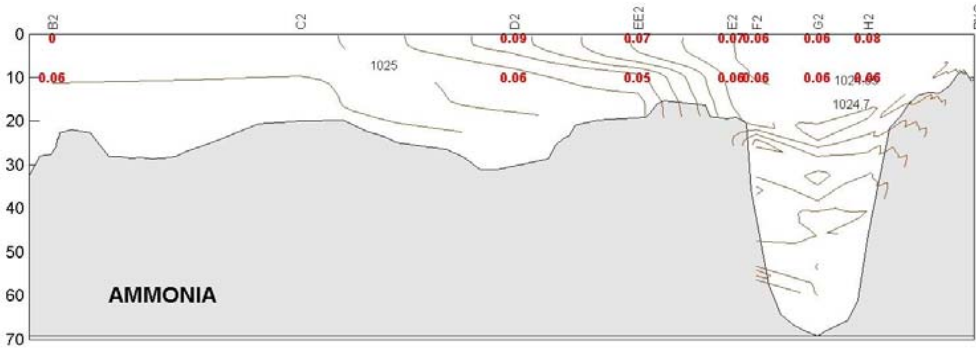
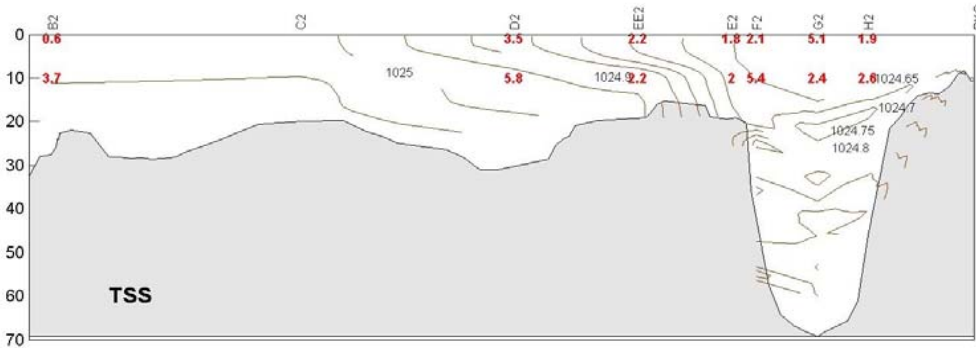


DO in mg/L

Chlorophyll in mg/m<sup>3</sup>

Harbour Water Quality Monitoring Program

CHEMISTRY

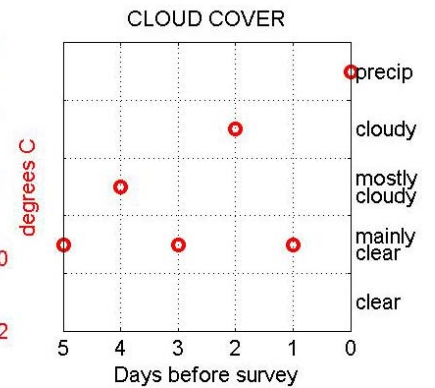
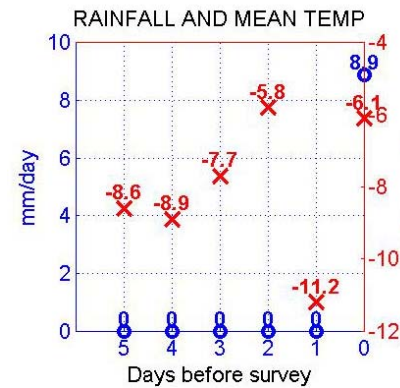
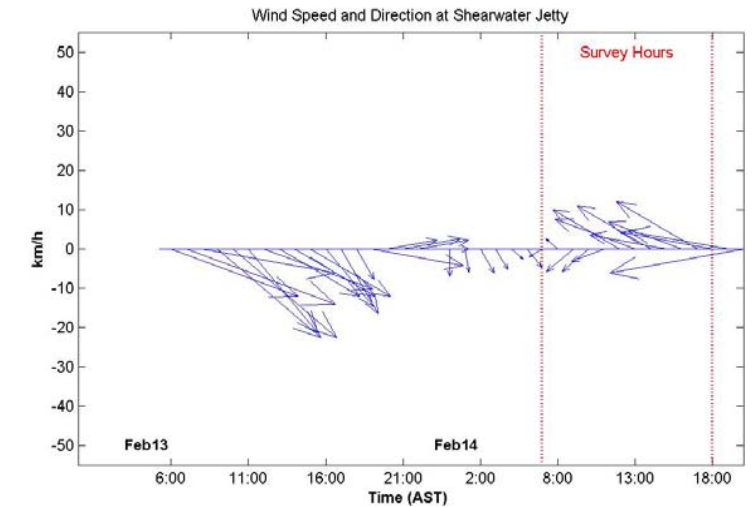
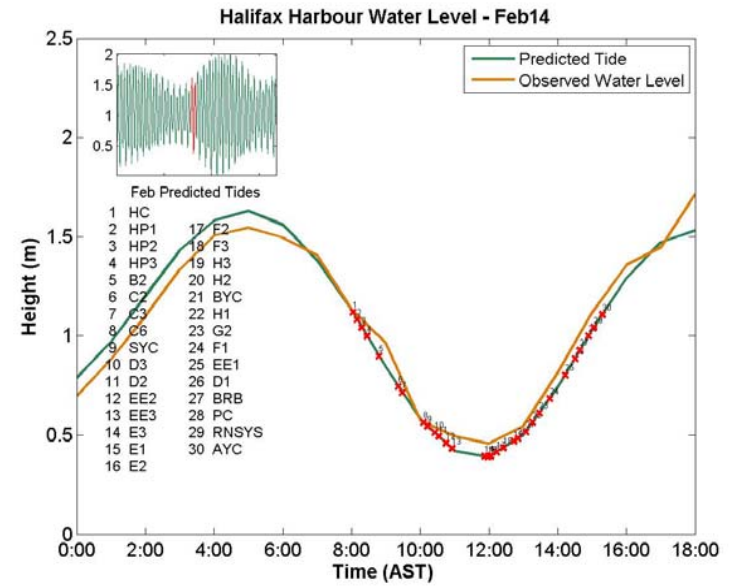


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Potential Density in  $\text{kg/m}^3$

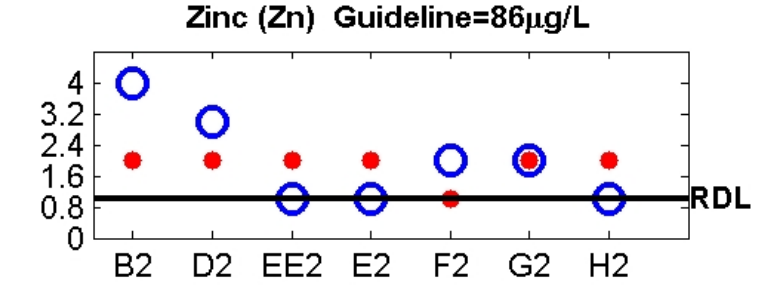
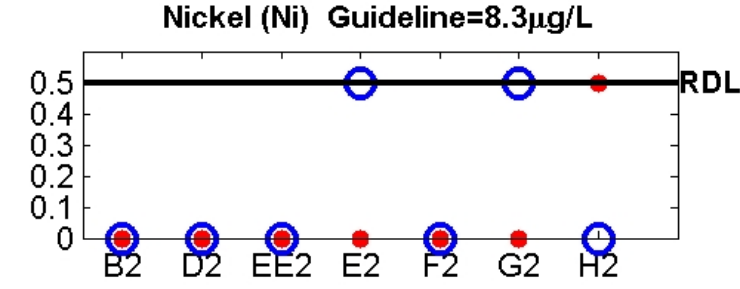
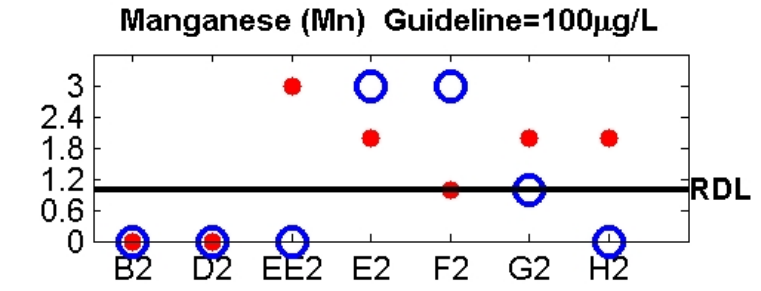
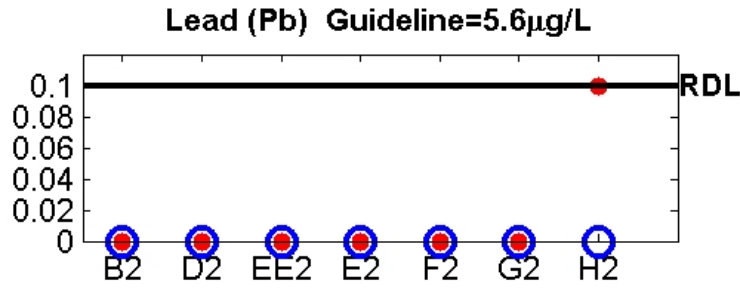
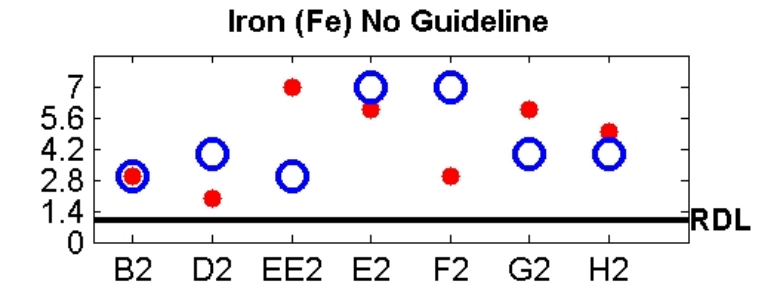
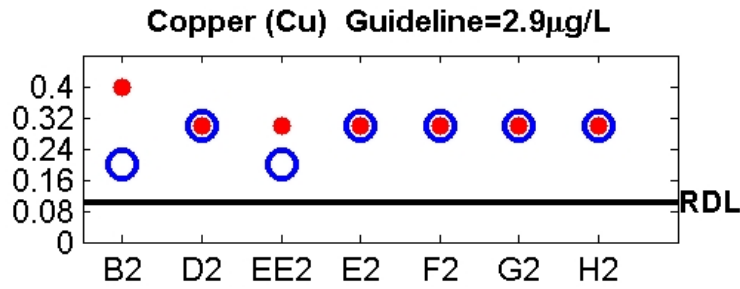
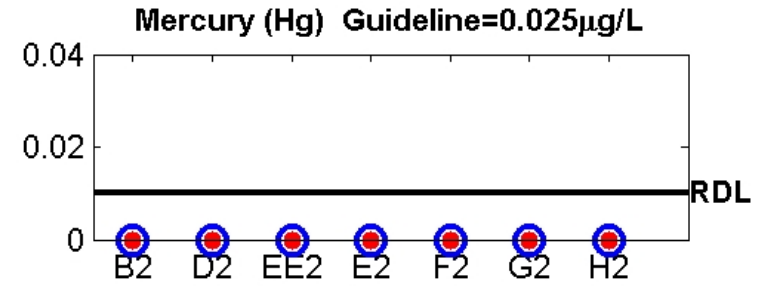
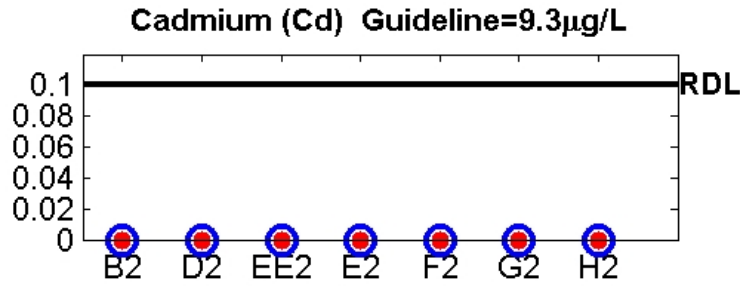
Ammonia in  $\text{mg/L}$

TSS in  $\text{mg/L}$



precip  
 cloudy  
 mostly cloudy  
 mainly clear  
 clear





**LEGEND**  
 ○ = Ten Metre Sample  
 ● = One Metre Sample  
 RDL = Reportable Detection Limit